

tor of the library's motion-picture center, accompanied by a team of archivists from major film companies including Metro-Goldwyn-Mayer Inc. and the United Artists Corp., was to visit the University of Delaware laboratories of Dr. Charles S. Ih, who developed the technique.

Current methods for preserving the color movies are expensive and do not ensure accurate color reproduction. As films age, chemical dissociation of the dyes results in irreversible deterioration that limits color-film lifetimes to 5 to 40 years depending on how the film is processed and stored. The reproduction of "Gone with the Wind" by such conventional means, for example, cost about \$30,000. Dr. Ih proposes holographic storage of the images on black-and-white film which can have a shelf life of 300 years. His method relies on superposition of three or more monochrome holograms, each representing an image formed in one of the primary colors.

The holograms are generated by illuminating the original film with laser light in the blue, green and red so that images of the same scene in each of the three colors are recorded on the same hologram. Subsequent illumination of the developed hologram with reference beams from the each of the three lasers generates an image with the same spectral balance as the original. Ih has used the 632.8-nanometer helium-neon line, the 514.5-nm argon-ion line and the 441.6-nm line of helium-cadmium, but is considering other lines also.

Problems with the laser process include the effects of speckle and scatter arising from scratches and surface roughness on the original film. The operating speed of Dr. Ih's holographic recording is limited but he plans to construct a transport mechanism for the holographic film that will allow recording at 24 frames per second, the speed at which motion pictures are projected. ©

Six-month index to *Laser Focus*

Vol 14 No 1 (Jan 1978) through No 6 (Jun 1978)

Major articles are arranged by subject. Cumulative indexes appear every January and July

1 Lasers

Shiva produces 10.2 kJ in first shot at Livermore Jan p26
First arm of Los Alamos CO₂ passes 1.25-kJ goal Jan p28
GTE builds excimer with 40-W average power Jan p28
Subminiature 'tea' lasers have 1-mm discharge Jan p30
Two new blue-green sources demonstrated by NRL Jan p34
E-beam-pumped HgCl₂ emits 200 MJ in blue-green Jan p36
Compression of KrF pulses studied for fusion Feb p24
Diode lasers for fiber systems cited at International Electron Devices Meeting Mar p46
Livermore demonstrates first atomic group-VI laser Apr p28
Sulfur-laser driver goal of \$1.5M DoE effort Apr p28
Update on 16- μ m laser development Apr p36
Search for fusion lasers described at inertial-confinement meeting Apr p40
Nonlinearities in laser-stripe geometry increase linearity of diode-laser output power Apr p48
Burleigh introduces commercial F-center laser Apr p62
Buried-heterostructure diode offered by Hitachi May p84
CW dye emits 34 W at Gottingen Jun p12
Efficient ring-resonator dye built at Spectra-Physics Jun p16
Tuning range of continuous-wave dyes extended at long and short wavelengths Jun p18
F-center laser developer identified as Kenneth German of Burleigh Jun p22
First protonbeam pumping of gas lasers at NRL Jun p24

Eight-beam fusion CO₂ at Los Alamos yields 8.3 kJ Jun p26
Tests of 20-arm Shiva glass laser begin at Livermore Jun p26
First Cl₂ laser emits 96 mJ at Sandia Jun p28
Simple dye laser produces narrowband pulses without beam expansion Jun p34
A combustor-driven carbon-monoxide laser, by Ralph J. Richardson and Thomas J. Menne Jun p50

2 Chemistry, spectroscopy & isotope separation

States similar to SF₆ 'quasicontinuum' are observed Jan p30
Exxon-Avco uranium-enrichment work classified Feb p4
High-resolution spectroscopy at U.S.-Japan seminar Feb p12
Sohio planning to develop chemical applications Mar p4
Uranium-equilibrium observations at Los Alamos contradict Soviet results Mar p20
Optogalvanic-effect spectroscopy, by David S. King and Peter K. Schenck Mar p50
Optogalvanic studies of line profiles in a helium-neon plasma, by Thomas F. Johnston Jr. Mar p58
'Cars' system for chemists, by John J. Black et al Mar p84
Multiphoton absorption in SF₆, reported by Exxon Apr p4
Laser-enrichment emphasis shifted to tailings Apr p6
Update on 16- μ m laser development Apr p36
SF₆ studied in high vibrational states Apr p73
Isotopes separated in SeF₆ Apr p73
Laser-isotope budget to expand 5.1% to \$36.9M May p4
Los Alamos enriched milligrams of UF₆ in 1976 May p32
Exxon and Los Alamos to describe UF₆ work May p34
Refined techniques emphasized at Pittsburgh Conference May p47

News

Sum-frequency mixing for tunable uv, by F. B. Dunning *May p72*
CRC Handbook to list 41,000 atomic lines *Jun p34*
Laser applications emphasized at American Chemical Society meeting in Anaheim *Jun p36*

3 Fusion-research applications

Shiva's first shot yields 10.2 kJ at Livermore *Jan p26*
First arm of Los Alamos CO, passes 1.25-kJ goal *Jan p28*
Fusion program remains a prime customer for hardware *Jan p50*
Tenfold compression of KrF pulses sought for fusion *Feb p24*
Preview of inertial confinement fusion meeting *Feb p32*
Garching reports iodine-laser plasma tests *Mar p12*
Fusion budget includes \$20M for Shiva Nova *Mar p16*
KMS joins in fusion-hardware venture *Mar p18*
First atomic group-VI laser, for fusion, is demonstrated at Livermore *Apr p28*
DoE sponsors development of S-laser driver for fusion *Apr p28*
Search for fusion lasers described at inertial-confinement fusion meeting *Apr p40*
Support for laser fusion expected to drop slightly *May p4*
Eight-beam Los Alamos CO, emits 8.3 kJ in first tests *Jun p26*
Tests begin on Livermore's 20-beam Shiva *Jun p26*
Saturable absorbers for CO₂ fusion laser, by Joseph S. Ladish and Stephen J. Czuchlewski *Jun p57*

4 Communication applications

Meret demonstrates 200-MHz analog link *Jan p38*
Optical-communication market expected to double in 1978 *Jan p49*
Bell's prototype fiberoptic link in Chicago *Jan p58*
Valtec installs a telephone link in Las Vegas *Jan p64*
ITT building 8-km prototype for Army *Jan p66*
Nasa considers fibers to replace 13,000 miles of wire *Jan p66*
Electro-Optic Devices formed by Kahn and Times Wire *Jan p66*
Fiber-Optic Communications in the United States market report, reviewed by J. C. Hecht *Jan p76*
Europe looks to fibers for telephone expansion *Feb p68*
Siecor formed by Siemens and Corning *Feb p76*
Canada Wire establishes a fiberoptic division *Feb p76*
Communication sessions at Cleos *Feb p78*
Military and civilian system tests reviewed at National Telecommunications Conference *Mar p42*
Bell Canada and Northern Telecom join in Montreal tests *Mar p45*
Fiber Optics Technology formed by 3 Valtec alumni *Mar p45*
Diodes for fiber systems at electron-devices meeting *Mar p46*
Optical Communications Market, a market report, by Frost & Sullivan, reviewed by J. C. Hecht *Mar p78*
Fiber developer Maurer wins industrial-physics prize *Mar p92*
New fiber components described in Salt Lake City *Apr p48*
Bell's test link exceeding performance goals *Apr p54*
Harris building 8.8-km cable-tv trunk in Ontario *Apr p54*
Kentucky installs 2 fiber links in emergency network *Apr p54*
Fiberoptic Cable moves production to Orlando *Apr p55*
Corning to supply Canada Wire with 20,000 km of fiber *Apr p55*
Designing fiberoptic cable, by Eric N. Randall and Paul J. Dobson *Apr p56*
Fiber distribution to individuals proposed *May p58*
First fiberoptic trade show expects 30 exhibitors *May p63*
GTE installing 10.5-km phone link near Brussels *May p64*
GTE building 36- and 72-channel military systems *May p64*
Valtec cable transmits tv through a subway tunnel *May p66*
Splicing optical fibers, by Mark L. Dakss *May p66*
Hitachi offers buried-heterostructure with fundamental output for communications *May p84*
Kao and Hockham share Rank optoelectronics prize for early optical-fiber research *May p104*
Multiterminal fiber systems, by Larry L. Campbell *Jun p42*
First rural tests in U.S. could lead to lowest cost loans *Jun p45*
Harris building 51-km phone link in Alberta *Jun p46*
Times Fiber to install two tv trunks for Teleprompter *Jun p46*
Ontario cable-tv trunk to transmit 322-Mbit/s *Jun p48*
Canstar president predicts fibered computers by midyear *Jun p48*
Army finds three bidirectional couplers promising *Jun p48*

5 Materials working applications

Environment of GM plant causes problems for CO₂ lasers *Apr p50*
Multiaxis laser performs 3 machining jobs for GM *May p36*
Laser welder is controlled by laser edge detector *May p38*
Solar cells annealed with laser at Oak Ridge *Jun p34*

6 Measurement & inspection applications

Laser-based tv considered for border surveillance *Jan p39*
GM and Ford plants put laser inspection online *Feb p4*
FAA to use yag tracker in landing-system study *Feb p30*
EPA tests 2-frequency lidar for plume studies *Mar p24*
NRL plans ocean tests of fiberoptic sound detector *Mar p40*
Laser edge detector controls a laser welder *May p38*
Landing-system measurements begin after 2-month delay *May p46*
British police fear terrorists have laser-aimed rifle *May p46*
Laser interferometry for the machine shop, by Glenn O. Herremann, Frank Berry and Cecil Dowdy *May p78*

7 Military applications

Military programs remain major/hardware markets *Jan p50*
New interest in laser gyros, by Howard Greenstein *Feb p60*
Ring-interferometer approach avoids laser-gyro flaws *Mar p20*
Navy testing production-ready laser gyro on ship *Mar p25*
Army speeds target penetration by combining pulsed and continuous-wave beams *Mar p34*
Navy plans ocean tests of fiberoptic sonar detector *Mar p40*
Military fiber links reviewed at Los Angeles meeting *Mar p42*
Heat-shield study could aid in laser-weapon defense *May p38*
Unidentified military agency buying 36- and 72-channel fiber systems from GTE *May p64*
Darpa asks \$38M for high-energy lasers for space *Jun p28*
Laser damage to metals demonstrated at low pressure *Jun p30*

8 Information processing and graphics

Eocom building platemaker for topographic maps *Jan p36*
Laser-based tv considered for border surveillance *Jan p39*
FAA uses yag tracker for landing-system study *Feb p30*
EPA tests two-frequency lidar for plume studies *Mar p24*
IBM retains lead in supermarket scanners *Mar p30*
Laser 3D replication patented by Berkeley inventor *Mar p38*
Laser pointer finds niche in medical schools *Apr p26*
Navy tests 120° scanner for sea-floor mapping *May p44*
Landing-system study begins after 2-month delay *May p46*
IBM laser printer generates laser-readable bar codes *May p48*
Las Vegas paper begins production tests of laser exposure of electrostatic plates *Jun p32*

9 Biomedical applications

Glimpses of Soviet laser biology, by Leon Goldman *Feb p18*
Blood-analysis systems use he-ne's and microcomputers *Feb p22*
U of Wisconsin founds laser medical-treatment center *Apr p33*
Modified photocoagulators used to treat birthmarks *Apr p33*
Transport in cells studied with laser scattering *Jun p32*

10 Holography

Russians display holographic movies *Mar p32*
Holographic approach suggested for recognition of Chinese symbols *May p94*

11 Entertainment applications

Matsushita offers laserless videodisk *Jan p4*
BRH cracks down on laser lightshows *Feb p26*
Laser Magic opens in Boston *Feb p28*
Phillips stretches laser-videodisk playback to 2 hours *Mar p26*
MCA buys plant for manufacture of videodisks *Apr p4*
Animated images drawn with seven-color laserbeam *Apr p26*
Owens-Corning uses laser game at trade show *Mar p47*

12 Other applications

Metal-like reflectivity in semiconductors produced with picosecond laserpulses *Mar p36*
Fluorescent pulses are basis of delay generator *Apr p30*
Applications of gigawatt cw lasers for energy transmission discussed at Nasa energy-conversion meeting *May p40*
Laser-equipped rifle missing from British museum *May p46*
Fusion lasers suggested for laboratory generation of high-pressure shock waves *Jun p32*

13 Associated equipment

Broadband room-temperature detector of 10.6 μ m *Jan p32*

News

Efficiencies over 20% projected for broadband acousto-optic deflectors *May p30*
CW dyes developed for longer and shorter wavelengths *Jun p18*
New cavity dumper is spinoff of undersea dye laser *Jun p20*
Saturable absorbers for CO₂ fusion lasers, by Joseph S. Ladish and Stephen J. Czchlewski *Jun p55*
Pulsed-voltage source for small laboratories, by Stanley Humphries Jr. *Jun p57*

14 Principal meetings

Cleos '78 in San Diego previewed *Jan p12*
Electro-Optics Laser '77 in Anaheim *Jan p38*
U. S.-Japan seminar on high-resolution spectroscopy *Feb p12*
Soviet national seminar on biological applications, by Leon Goldman *Feb p18*
Inertial-confinement fusion in San Diego previewed *Feb p32*
Preview of Cleos '78 exhibition *Feb p40*
Communications sessions at Cleos previewed *Feb p78*
Holography and coherent optics in Strasbourg *Mar p32*
National Telecommunications Conference in Los Angeles *Mar p42*
International Electron Devices Meeting in Washington *Mar p46*
Cleos '78 roundup *Apr p12*
Inertial-confinement fusion meeting report *Apr p40*
Fiber and integrated optics in Salt Lake City *Apr p48*
Preview of IQEC technical sessions *May p12*
UF, photochemistry to be described at IQEC *May p34*
Nasa energy-conversion meeting *May p40*
Pittsburgh Conference in Cleveland *May p47*
IQEC exhibition preview *May p50*
International Symposium on Subscriber Loops and Services in Atlanta, *May p58*
Fiber Optic Con planned in Boston *May p63*
First biennial European conference in Brighton *Jun p12*
American Chemical Society in Anaheim *Jun p36*

15 Technology & design features

Bell System's fiberoptic link in Chicago *Jan p58*
Progress report on laser gyros, by Howard Greenstein *Feb p60*
Time-correlated photon counting, by G. Spears *Feb p96*
Optogalvanic-effect spectroscopy, by David S. King and Peter K. Schenck *Mar p50*
Optogalvanic studies of he-ne lines, by T. F. Johnston *Mar p58*
'Cars' system for chemists, by John J. Black et al *Mar p84*
Designing fiberoptic cable, by Eric N. Randall and Paul J. Dobson *Apr p56*
Positioning equipment, an LF survey *Apr p79*
Splicing optical fibers, by Mark L. Dakss *May p66*
Frequency mixing for tunable uv, by F. B. Dunning *May p72*
Laser interferometry for the machine shop, by Glenn O. Herremann, Frank Berry and Cecil Dowdy *May p78*
Multiterminal fiber systems, by Larry L. Campbell *Jun p42*
Purely chemical carbon-monoxide laser, by Ralph J. Richardson and Thomas J. Menne *Jun p50*
Saturable absorbers for CO₂ fusion laser, by Joseph S. Ladish and Stephen J. Czuchlewski *Jun p55*
A pulsed high-voltage system for small laboratories, by Stanley Humphries Jr. *Jun p57*

16 Safety & standards

BRH cracks down on laser light shows *Feb p26*
BRH grants Coherent a variance on laser linemaker *Mar p28*
Policy on lightshow variances eased by BRH *Apr p25*
BRH expands loans of calibrated power meters *May p47*

17 Business & organizations

Tenth annual economic review and outlook *Jan p40*
Valtec installs fiber phone link in Las Vegas *Jan p64*
Electro-Optic Devices formed by Kahn and Times Fiber *Jan p66*
Fiber-Optic Communications in the United States, market report by International Resource Development, reviewed by J. C. Hecht *Jan p76*
Litigation on Gould's laser patent could take a year *Feb p4*
Refac's side of the Gould laser-patent case, a letter by Eugene M. Lang *Feb p8*
BRH cracks down on laser lightshows *Feb p26*
Siecor formed by Siemens and Corning to make cables *Feb p76*
Bell Labs disputes Gould patent claim *Mar p4*

Sohio preparing inhouse effort in laser chemistry *Mar p4*
\$20M for Shiva Nova included in DoE fusion budget *Mar p16*
KMS joins in fusion-hardware venture *Mar p18*
End to overseas trade-center shows urged by congressional committee *Mar p26*
Valtec merges 3 optics division *Mar p30*
Fiberoptics Technology formed by 3 Valtec alumni *Mar p45*
Optical Communications Market, a report by Frost & Sullivan, reviewed by J. C. Hecht *Mar p78*
Valtec completes purchase of CommScope *Mar p94*
Army Electronics Command split into 3 groups *Mar p97*
Gould trying to add 8 laser makers as codefendants *Apr p4*
Isotope-enrichment emphasis shifted to tailings *Apr p6*
Laser pointer finds niche at medical schools *Apr p26*
Profit doubles at Spectra but slips at Coherent *Apr p36*
Fiberoptic Cable moves production to Orlando *Apr p55*
Corning to sell 20,000 km of fiber to Canada Wire *Apr p55*
Burleigh introduces commercial F-center laser *Apr p62*
Gould named 'inventor of the year' *Apr p92*
United Detector and Silicon Detector drop suits *Apr p97*
Valtec profit doubles to \$1.3 million in 1977 *Apr p97*
Navy negotiating \$1M-a-year pact with Stanford U *May p4*
Coherent profit doubled in quarter to Apr 1 *May p4*
Hitachi introduces buried-heterostructure diode *May p84*
European firms introduce dye and argon lasers *Jun p12*
Spectra-Physics moves optics group to new building *Jun p18*
Phase-R develops cavity dumper as spinoff of Navy contract for undersea dye laser *Jun p20*
Burleigh identifies inhouse developer of F-center laser as Kenneth German *Jun p22*
First rural fiber tests could lead to lowcost loans *Jun p45*
Harris gets \$6.6M contract for 51-km phone link *Jun p46*
Canstar president predicts fibered computers by midyear *Jun p48*

18 Authors

BARNES, Norman, reviews *Nonlinear Infrared Generation*, *Mar p76*
BERRY, Frank et al, Laser interferometry for the machine shop *May p78*
BLACK, John J. et al, 'Cars' for chemists *Mar p84*
CAMPBELL, Larry L., Multiterminal fiber systems *Jun p42*
CZUCHLEWSKI, Stephen J. and Ladish, Joseph S., Saturable absorbers for CO₂ fusion *Jun p55*
DAKSS, Mark L., Splicing optical fibers *May p66*
DOBSON, Paul J. and Randall, Eric N., Designing fiberoptic cable *Apr p56*
DOWDY, Cecil et al, Laser interferometry for the machine shop *May p78*
DUNNING, F. B., Frequency mixing for tunable uv *May p72*
GILSON, Trevor R. et al, 'Cars' for chemists *Mar p84*
GOLDMAN, Leon, Soviet effort in laser biology *Feb p18*
GOLDSTEIN, Robert, reviews *Progress in Optics Vol 14*, *Apr p70*
GREENHALGH, Douglas A. et al, 'Cars' for chemists *Mar p84*
GREENSTEIN, Howard, Laser-gyro progress report *Feb p60*
HERREMANN, Glenn O. et al, Laser interferometry for the machine shop *May p78*
HUMPHRIES, Stanley Jr., Pulsed high-voltage system for small laboratories *Jun p57*
JOHNSTON, Thomas F. Jr., Optogalvanic studies of he-ne line profiles *Mar p58*
KING, David S. and Schenck, Peter K., Optogalvanic-effect spectroscopy *Mar p50*
LADISH, Joseph S. and Czuchlewski, Stephen J., Saturable absorbers for CO₂ fusion system *Jun p55*
LANG, Eugene M., Refac's side of the Gould patent case, a letter *Feb p8*
LAYCOCK, Leslie C. et al, 'Cars' for chemists *Mar p84*
LETOKHOV, V. S., reviews *Chemical and Biochemical Applications of Lasers Vol 2* *May p92*
MENNE, Thomas J. and Richardson, Ralph J., Combustor-driven carbon-monoxide laser *Jun p50*
RANDALL, Eric N. and Dobson, Paul J., Designing fiberoptic cable, *Apr p56*
RICHARDSON, Ralph J. and Menne, Thomas J., Combustor-driven carbon-monoxide laser *Jun p50*
SCHENCK, Peter K. and King, David S., Optogalvanic-effect spectroscopy *Mar p50*
SIEGMAN, Anthony E., reviews *Principles of Lasers*, *Feb p90*
SPEARS, Kenneth G., Time-correlated photon counting for decay-signal analysis *Feb p96*

Six-month index to *Laser Focus*

Vol 14 No 7 (Jul 1978) through No 12 (Dec 1978)

Major articles are arranged by subject. Cumulative indexes appear every January and July

1 Lasers

XeF rep rate boosted by multicircuit pulser *Jul p20*
XeCl efficiency quintupled by diluting with neon *Jul p21*
Unstable-resonator yag, by R. L. Byer and R. Herbst *Jul p48*
Free-electron laser theory debated at IQEC *Aug p12*
30 copper-vapor lasers at Livermore *Aug p35*
Fluorophosphate laser-glass prototypes to be fabricated by Owens-Illinois *Aug p35*
Early days of laser research, by Charles H. Townes *Aug p52*
Optically pumped mid-ir lasers, by C. R. Jones *Aug p68*
Picosec lasers yield more energy and better beams *Sept p16*
1-kW discharge-pumped KrF laser for Los Alamos *Sept p18*
Ring-dye laser commercialized by Spectra-Physics *Sept p68*
10-J e-beam-pumped excimer offered by Maxwell *Sept p68*
Nuclear-pumped laser progress, by S. Douglas Marcum *Oct p12*
CO₂ fusion laser could reach 10% efficiency *Nov p28*
42-MW lasers called 'nearterm' technology *Nov p32*
Scaling of gasdynamic and cw HCl lasers *Dec p30*
Singlemode diode lasers offered by Laser Diode Labs; 1.2- μ m lasers expected this year *Dec p40*
Rochester's 30-TW Omega laser, by Jay M. Eastman, John A. Boles and John M. Soures *Dec p48*

2 Chemistry, isotope separation & spectroscopy

Deuterium enriched efficiently with new NRL process *Jul p22*
Atomic and Laser Spectroscopy reviewed by Reed Jensen *Jul p83*
Multiphoton ionization of D₂O, journal review *Jul p88*
UF₆ dissociated with inexpensive lasers at USC *Aug p16*
Chemistry induced by vuv lasers studied at NRL *Aug p32*
30 Cu-vapor lasers to pump dye for enrichment *Aug p35*
Picosecond spectroscopy meeting at Hilton Head *Sept p12*
1-kW KrF laser likely to find isotope-separation applications at Los Alamos *Sept p18*
Saturation spectroscopy performed with a commercial tunable-diode laser *Oct p43*
Laser fluorescence studied to monitor lettuce growth *Nov p43*
Lasers manipulate molecules, by Colin Steel *Dec p14*
First regional laser-chemistry lab at U of Penn *Dec p18*
Pulsed-power problems could delay isotope enrichment *Dec p26*

3 Fusion research

Neutron-yield record set in first 20-beam Shiva tests *Jul p18*
Laser-fusion powerplants proposed for starships *Aug p6*
Los Alamos CO₂ laser passes power and energy goals *Aug p32*
Raman pulse-shortening demonstrated at Livermore *Aug p35*
DoE panel urges closer coordination between inertial- and magnetic-fusion programs *Sept p20*
Target experiments at Rutherford, by Alan F. Gibson and Michael H. Key *Sept p36*

Categories

- 1 Lasers
- 2 Chemistry, isotope separation & spectroscopy
- 3 Fusion research
- 4 Fiberoptic communication
- 5 Materials working
- 6 Measurement & inspection
- 7 Military applications
- 8 Information processing & graphics
- 9 Biomedical applications
- 10 Other research
- 11 Holography
- 12 Entertainment
- 13 Other applications
- 14 Associated equipment
- 15 Materials
- 16 Principal meetings
- 17 Design & technology features
- 18 Safety & standards
- 19 Business & organizations
- 20 Social issues
- 21 Authors

Liquid-lithium 'waterfall' to extract fusion energy *Oct p25*
Classified fusion technology opened to commercial contractors by DoE *Oct p25*
KMS fusion promised longterm DoE contract *Oct p29*
E-beam target compression recorded holographically *Nov p26*
CO₂ fusion laser seen attaining 10% efficiency *Nov p28*
Rochester's Omega laser for fusion experiments, by Jay M. Eastman, John A. Boles and John M. Soures *Dec p48*

4 Fiberoptic communication

A Systems

Military attracted by light weight of fiber links *Jul p40*
Bell plans first standard fiber link in 1980 *Jul p41*
Harris demonstrates repeaterless 200-Mbit/s transmission for Nasa *Jul p41*
Two fiber links considered by Citibank *Jul p44*
Home fiber-link economics questioned in Canada *Aug p60*
Second 'operational' military link from ITT *Aug p65*
NEC installs fiber phone trunk for Disney World *Sept p46*
4-fiber cable-tv link built by Valtec and Harris *Sept p48*
Home-phone fiber links to be tested by Bell Canada *Oct p62*
Commercial systems highlight FOC '78 *Nov p46*
Rural test of interactive video transmission via fibers planned in Manitoba *Nov p51*
Fiber system installed in nuclear powerplant *Nov p52*
Repeaterless 53-km transmission at 1.3 μ m by NTT *Nov p52*
GTE's next fiber test planned for Fort Wayne *Nov p54*
Enhancement of Las Vegas link to 44.5 Mbit/s considered by Centel and Valtec *Nov p54*

Fibers transmit data within Livermore's Shiva laser *Nov p55*
 Bell system plans first 'standard' fiber link *Dec p4*
 European system tests highlight Genoa meeting *Dec p36*
 90 km of optical cable planned for 100-kJ fusion laser at Los Alamos *Dec p40*
 United, third-largest U.S. phone company, to install first fiber link in Pennsylvania *Dec p41*

B Components

Standards for fiber optics, by Robert Lebduska *Jul p44*
 Fiber packaging upgraded by Corning *Aug p65*
 Three panels to develop international standards *Sep p48*
 Nuclear-radiation effects on fibers, by E. Joseph Friebele, George H. Sigel Jr. and Michael E. Gingerich *Sep p50*
 Nippon Telephone designs undersea cable *Sep p57*
 Transmitter and receiver ICs offered by Spectronics *Sep p77*
 Linearized transmitters, by Jozef Straus *Oct p54*
 Low-loss mid- and far-ir fibers, journal review *Nov p57*
 Directional couplers offered by Canstar *Nov p74*
 3.5-mW singlemode lasers offered by Mitsubishi *Nov p74*
 Singlemode lasers offered by Laser Diode; 1.2- μ m lasers expected by year-end *Dec p40*
 Avalanche photodiodes for long wavelengths, by Louis R. Tomasetta, H. David Law and Kenichi Nakano *Dec p42*

C Research

3-by-3 optical-matrix switch studied by Sperry *Jul p42*
 20-ps pulses obtained from diode laser at MIT *Jul p43*
 1.27- μ m laser modulated at 1.1 Gbit/s, journal review *Aug p67*
 Effects of nuclear radiation on fibers, by E. Joseph Friebele, George H. Sigel Jr. and Michael E. Gingerich *Sep p50*
 Bistable integrated-optic switch at Bell Labs *Nov p56*
 Developing avalanche diodes for long wavelengths, by Louis R. Tomasetta, H. David Law and Kenichi Nakano *Dec p42*

D Business

Belden forms group to supply fiberoptic cable *Jul p42*
 Canstar receives \$825,000 contract for tv cable *Jul p43*
 Motorola introduces low-cost sources and detectors *Jul p43*
 Fiberguide Industries formed to make low-loss fiber *Jul p43*
 Fiber trade show scheduled in March by IEEE and OSA *Aug p65*
 35 companies plan exhibits at FOC '78 *Sep p44*
 Fort's British subsidiary plans plant in Cambridge *Sep p48*
 Canoga Data Systems formed to offer computer links *Sep p50*
 Spectronics offers ICs for transmitters and receivers *Sep p77*
 Valtec names Frank M. Drendel chief executive *Sep p90*
 Valtec plans \$1.8-million plant for Laser Diode Labs *Oct p61*
 Northern Telecom to produce analog video trunks *Oct p62*
 Commercial systems proliferate at FOC '78 *Nov p46*
 ITT E-O Products triples fiber facilities *Nov p56*
 Canstar offers directional couplers *Nov p77*
 Mitsubishi offers 3.5-mW singlemode lasers *Nov p77*
 International trade in fiber optics, editorial *Dec p6*
 Lasers in Reprographics and Communications market study, reviewed by Jeffrey C. Hecht *Dec p84*

5 Materials working

Industrial CO₂ bought by USC with support from NSF *Aug p38*
 CO₂ cutting aids effort to recover Civil War ironclad *Sep p30*
 21st heat-treating laser ordered by General Motors *Nov p24*
 2.5-kW industrial CO₂ at General Motors Institute *Dec p21*
 Computerized laser drill offered to machine shops *Dec p22*
 Laser welding simplifies relay inspection *Dec p22*
 CO₂ system engraves flexographic printing plates *Dec p34*
 Metalworking with yag, by Simon L. Engel *Dec p66*

6 Measurement & inspection

Scanning laser system checks tape-reel dimensions *Jul p26*
 Laser increases angular-encoder resolution 20-fold *Aug p46*
 Particulate studies by holocamera, by J. D. Trolinger *Aug p78*
 Particulates from burning coal measured with laser *Oct p26*
 Latent fingerprints detected by laser fluorescence *Oct p44*
 Nasa receives fifth laser ranger from Contraves *Nov p40*

7 Military applications

Martin Marietta developing laser pod for F-18 *Jul p28*
 Honeywell joins Ferranti in rangefinder development *Aug p36*
 CO₂ pulses clear fog from path of high-power beam *Oct p42*
 Manufacture of laser gyros begins at Honeywell plant *Nov p22*
 'Low-cost' laser gyro seen meeting most aircraft needs *Nov p24*

42-MW lasers seen as 'near-term' technology *Nov p32*
 Rand cites military goals of Soviet pulsed-power work *Nov p38*
 1-Gbit/s laser system for satellite communication to undergo aircraft tests for Air Force *Nov p55*
 High-power-materials emphasis shifted by Darpa *Dec p23*

8 Information processing & graphics

Videodisk for the deaf developed by MCA *Jul p21*
 Laser scanner adds computer-graphics capability to Xerox color copier *Sep p24*
 Two laser recorders from RCA are on line at Nasa *Sep p28*
 Dye-laser technique could record 10¹⁵ bits/m² *Sep p30*
 Reflective recording material developed by Drexler *Nov p38*
 Univac drops its supermarket-scanning effort *Nov p42*
 Diode laser records 20 Gbits on disk at Philips *Dec p26*
 Flexographic printing plates engraved with CO₂ laser *Dec p34*

9 Biomedical applications

Picosecond studies of photosynthesis in USSR *Jul p22*
 Birthmarks treated with laser at Japanese hospital *Jul p28*
 Laser surgery for otherwise-inoperable brain tumors *Aug p45*
 'Ripple' in nerve cells observed with laser *Aug p45*
 Picosecond applications in biophysics *Sep p12*
 Surgical system uses compact, handheld CO₂ *Sep p34*

10 Other research

Phase conjugation introduced at IQEC *Aug p12*
 Picosecond research described at Hilton Head *Sep p12*
 DoE building \$10-million center for combustion research with lasers at Sandia in Livermore *Sep p34*
 Phase conjugation at 10.6 μ m, journal review *Oct p92*

11 Holography

Holography studied to preserve color in movies *Jul p28*
 Holocamera for particulate studies, by J. D. Trolinger *Aug p78*
 Multiplex holograms being produced in volume for advertising displays *Oct p38*
 IR holographers test quality of germanium lenses *Oct p40*
 E-beam target compression recorded holographically *Nov p26*

12 Entertainment

Videodisk for the deaf developed by MCA *Jul p21*
 Videodisk development may await recording standards *Nov p4*
 Battle-simulation park employs 10-mW He-Ne lasers *Nov p40*
 Laserium projector granted safety variance by BRH *Nov p42*
 Laser 'opera' climaxes Washington lightshow series *Nov p43*
 Knoxville street festival accompanied by laser show *Dec p34*

13 Other applications

Laser-fusion powerplants proposed for starships *Aug p6*
 Latent fingerprints detected by laser fluorescence *Oct p44*
 New company formed to manufacture laser canes *Oct p44*
 Aircraft powered with 42-MW lasers called a 'near-term extension' of technology *Nov p32*

14 Associated equipment

New yag-doubling crystal gets rave reviews *Jul p18*
 Multicircuit pulse generator boots XeF rep rate *Jul p20*
 Damage thresholds of coatings for pulsed CO₂ lasers, by Brian Newnam *Jul p58*
 Frequency triplers for yag, by Robert Pixton *Jul p66*
 Evaluating high-speed detectors, by S. I. Green *Sep p60*
 Tradeoffs in selecting lock-in amplifiers, survey *Oct p66*
 Specifying optics, by Nick Lurowist *Nov p58*
 Replication of laser optics, by Harold Weissman *Dec p62*

15 Materials

New nonlinear crystal efficiently doubles frequency of high-power yag *Jul p18*
 Fluorophosphate-glass prototypes being fabricated at Owens-Illinois *Aug p35*
 Sapphire and ruby fabrication, by Vito J. Lazazzera *Aug p75*
 Chemical-vapor deposition of ir materials *Oct p40*

16 Principal meetings

Fiber Optic Con and Electro/78 in Boston Jul p36
International Quantum Electronics Conference Aug p12
International Conference on Communications Aug p60
IEEE and OSA schedule new fiber meeting and show Aug p65
Sixth International Conference on Atomic Physics in USSR to be boycotted Sep p4
OSA Topical Meeting on Picosecond Phenomena Sep p12
Preview of FOC '78 in Chicago Sep p44
Nuclear-induced plasmas and nuclear-pumped lasers in Orsay, by S. Douglas Marcum Oct p12
Selective preview of OSA annual meeting Oct p46
FOC '78 emphasizes commercial hardware Nov p46
Laser-induced processes in molecules, by C. Steel Dec p14
Laser-induced damage in optical materials Dec p23
Symposium on Gas-Flow and Chemical Lasers Dec p30
European Conference on Optical Communication Dec p36

17 Design & technology features

Unstable-resonator yag, by R. L. Byer and R. L. Berbst Jul p48
Damage thresholds of coatings for pulsed CO₂ lasers, by Brian Newnam Jul p58
Tripling yag's frequency, by Robert Pixton Jul p66
Optically pumped mid-ir lasers, by C. R. Jones Aug p68
Fabricating sapphire and ruby, by Vito Lazazzera Aug p75
Holocamera for particulate studies, by J. D. Trolinger Aug p78
Nuclear-radiation effects on fibers, by E. Joseph Friebele, George H. Sigel Jr. and Michael E. Gingerich Sep p50
Linearized transmitters, by Jozef Straus Sep p54
Evaluating fast detectors, by Samuel I. Green Sep p60
Lockin-amplifier survey Oct p66
Specifying optics, by Nick Lurosist Nov p58
Replication of laser optics, by Harold Weissman Dec p62
Metalworking with yag, by Simon L. Engel Dec p66

18 Safety & standards

Laser safety and BRH, letter by David J. Monnier Jul p8
EIA preparing 'definitive' laser-injury record Jul p12
Fiberoptic standards, by Robert Lebduska Jul p44
Ansi and EIA oppose state code suggested by BRH Aug p4
Changes in BRH and Ansi standards, editorial Sep p6
State view of safety, letter by Francis J. Bradley Sep p8
EIA urges changes in BRH proposal for state code Sep p26
3 panels to develop international fiber standards Sep p48
BRH changes violation-notice procedure Oct p103
BRH grants safety variances for Laserium projector Nov p42
BRH on safety, letter by John C. Villforth Dec p8
EIA injury survey draws few responses Dec p23

19 Business & organizations

Doyle succeeds Dyman as Laser Precision's president Jul p4
Letokhov and Chebotayev win Lenin Prize Jul p100
Laser Applications Ltd. to produce highpower CO₂ and chemical lasers Aug p4
Optical Filters Corp. formed in Natick, Mass. Aug p4
Owens-Illinois wins fluorophosphate-glass order Aug p35
Honeywell joins Ferranti in rangefinder effort Aug p36
USC laser center buys industrial CO₂ with NSF support Aug p38
J. K. Lasers expanding Aug p38
China presses laser development Aug p40
Australian industry's dilemma by Peter Black Aug p49
Spectra-Physics quarterly profit reaches \$1.6M Sep p4
Coherent doubles quarterly earnings Sep p4
Spectra-Physics commercializes ring-dye laser Sep p68
Maxwell offers 10-J e-beam-pumped excimer laser Sep p68
Economy remains strong Oct p4
Spectra to fight U.S. demand to divest Laserplane Oct p24
KMS Industries sells \$1.2 million of stock Oct p29
Dollar's slide has little effect on Japanese sales Oct p32
Xonic's losses put financial pressure on Hadron Oct p34
Spectra splits laser-products division in 3 Oct p36
General Photonics charged with patent infringement Oct p42
Spectra commits \$15 million for expansion Nov p4
Photon Sources rejects Control Laser's bid Nov p4
Pattern of salary increases Nov p14

Honeywell begins manufacture of laser gyros Nov p22
Burleigh moves into new building Nov p42
Univac drops out of supermarket scanning Nov p42
Spectra-Physics buys Laser Analytics Dec p4
Coherent buys Laser Inc. Dec p4
NSF establishes first regional laser lab Dec p18
Spectra-Physics plans expansion based on 25% yearly growth in sales Dec p28
PTR buys Baird's optical-filter operations Dec p28
Lasers in Reprographics and Communications, market study reviewed by Jeffrey C. Hecht Dec p84
The Expanding Laser Industry, market study reviewed by Howard Rausch Dec p85

20 Social issues

The Physicists: The History of a Scientific Community in Modern America, reviewed by Howard Rausch Aug p91
Americans divided on avoiding Soviet meetings Sep p4
The Soviet boycott, editorial Oct p6
Dealing with the human-rights issue in a visit to the USSR, guest editorial by Michael S. Feld Nov p6
U.S. fusion researchers conduct a seminar for Soviet 'refuseniks' Nov p34

21 Authors

BLACK, Peter, Australia's laser industry Aug p49
BOLES, John A. et al, Rochester's Omega laser Dec p48
BRADLEY, Francis J., State view of safety regulations, a letter Sep p8
BYER, Robert L. and Herbst, Richard L., The unstable-resonator yag laser Jul p48
EASTMAN, J. M. et al, Rochester's Omega laser Dec p48
ENGEL, Simon L., Metalworking with yag Dec p66
FALK, Joel, reviews An Introduction to Lasers and Their Applications Aug p93
FELD, Michael S., Dealing with the human-rights issue in a visit to the USSR, guest editorial Nov p6
FOWLES, Grant R., reviews Optics and Lasers Sep p82
FRIEBELE, E. Joseph et al, Effects of nuclear radiation on optical fibers Sep p50
GIBSON, Alan F. and Key, Michael H., Target experiments at Rutherford Sep p36
GINGERICH, Michael E. et al, Effects of nuclear radiation on optical fibers Sep p50
GREEN, S. I., Evaluating fast detectors Sep p60
HERBST, Richard L. and Byer, Robert L., The unstable-resonator yag laser Jul p48
JENSEN, Reed J., reviews Atomic and Laser Spectroscopy Jul p83
JONES, C. R., Optically pumped mid-ir lasers Aug p68
KEY, Michael H., and Gibson, Alan F., Target experiments at Rutherford Sep p36
LAW, H. David et al, 1.3- μ m avalanche diodes Dec p42
LAZAZZERA, Vito J., Fabricating optics from sapphire and ruby Aug p75
LEBDUSKA, Robert, Fiberoptic standards Jul p44
LUROWIST, Nick, Specifying optics Nov p58
MARCUM, S. D., Progress in nuclear lasers Oct p12
NAKANO, Kenichi et al, 1.3- μ m avalanche diodes Dec p42
NEWNAM, Brian, Coating damage from pulsed CO₂ Jul p58
PIXTON, Robert, Tripling yag's frequency Jul p66
SIEGMAN, Anthony E., reviews Ultrashort Light Pulses: Picosecond Techniques and Applications Oct p83
SIGEL, George H. Jr. et al, Effects of nuclear radiation on fibers Sep p50
SOURCES, J. M. et al, Rochester's Omega Laser Dec p48
STEEL, Colin, Laser manipulation of molecules Dec p14
STRAUS, Jozef, Linearized transmitters Oct p54
TOMASETTA, Louis R. et al, Avalanche photodiodes for long wavelengths Dec p42
TOWNES, Charles H., The early days of laser research, a recollection Aug p52
TROLINGER, James D., A holocamera for particulate measurements Aug p78
VILLFORTH, John C., BRH on safety, a letter Dec p8
WEISSMAN, Harold, Replicating laser optics Dec p62
WENDLAND, Paul H., reviews Optical and Infrared Detection Sep p82

